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RESOURCES OF TH APR 3 - 1964

CUMBERLAND REGION

KENTUCKY

Central States Forest Experiment Station, U.S. Dept. of Agriculture, Forest Service in cooperation with Kentucky Department of Conservation and Cumberland National Forest

U.S. Forest Service Resource Bulletin CS-1

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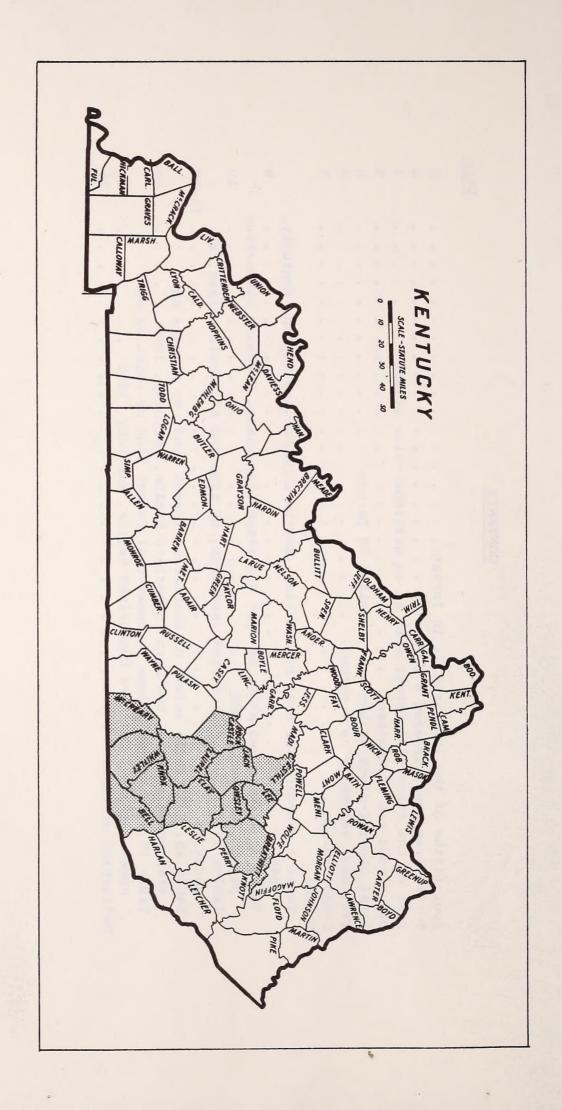


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Central States Forest Experiment Station, U.S. Dept. of Agriculture, Forest Service 111 Old Federal Building, Columbus 15, Ohio R. D. Lane, Director



FRONTISPIECE. -- Southern Cumberland Region in Kentucky.

FIGHLIGHTS

TIMBER RESOURCES OF THE

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KENTUCKY

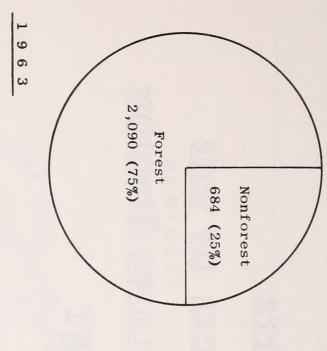
David A. Gansner, research forester Central States Forest Experiment Station

This brief report represents the first results of a new inventory of Kentucky's forest resources now underway. The last statewide forest inventory in Kentucky was completed in 1949. Since then the forest has changed. Presented here is a new look at the forest resource situation of a 12-county region in the heart of Kentucky's most productive timber-growing area. The data in this report, though preliminary and subject to minor changes, provide fresh statistics needed to plan for future demands on the forest resource. They also provide current information needed to establish and develop stable forest-based industries through-

out the State and particularly in those areas of Kentucky where local economic development is urgently needed.

The new survey is being conducted cooperatively by the U.S. Forest Service and the Kentucky State Department of Conservation.

The additional funds and manpower contributed by the State of Kentucky will permit a more intensive forest inventory supplemented by several special studies. As a result of this cooperation, a more thorough and precise picture of the State's forest resources can be presented.



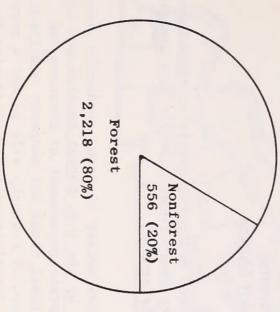


FIGURE 1.--Forest and nonforest area, 1949 and 1963 (in thousands of acres and percent).

Four-fifths of the Land Area is in Forest

The Southern Cumberland Region is heavily forested. Although this 12-county area accounts for less than 11 percent of the land surface of Kentucky, it contains about 20 percent of the State's total forest area.

More than 2.2 million acres (80 percent of the Region) are covered with woodland. The remainder of the land area is in farm, urban, and other nonforest uses.

Laurel is the only one of the Region's 12 counties that is less than 70 percent forested. Breathitt County, with 281,000 acres, has the most woodland, but McCreary is more densely forested--almost 96 percent.

Forest Area has Increased 6 Percent

In 1949 the Southern Cumberland contained 2,090,000 acres of forest land. Since then the forest has enlarged by 128,000 acres, an increase of 6.1 percent (fig. 1). Much of this increment is no doubt the result of a decline in agriculture. Both the number of farms and the total acreage of farmland in the Region have decreased sharply since 1949. Some of these abandoned farms have reverted to forest.

Less than 28,000 acres (1.2 percent) of the forest area in the Region is considered noncommercial. Four-fifths of this noncommercial forest is land which has been withdrawn from commercial use by reservation. The rest is unproductive forest incapable of producing industrial wood crops because of adverse site conditions. This leaves 2,190,500 acres of commercial forest land in the Region available for and capable of growing timber crops.

Commercial forest land has increased in 10 of the Region's 12 counties between forest inventories (fig. 2). The largest gains occurred in Breathitt, Clay, and Knox Counties. Slight decreases occurred in McCreary and Bell Counties.

Information on the ownership of commercial forest land is not yet complete. About 298,000 acres (14 percent) of the commercial forest land are in the Cumberland National Forest administered by the U.S. Forest Service. The remainder is either in other public holdings of federal, state, and local governments or in the hands of private individuals and industry. It is estimated that farmers alone own about one-fourth of the commercial forest in the Region.

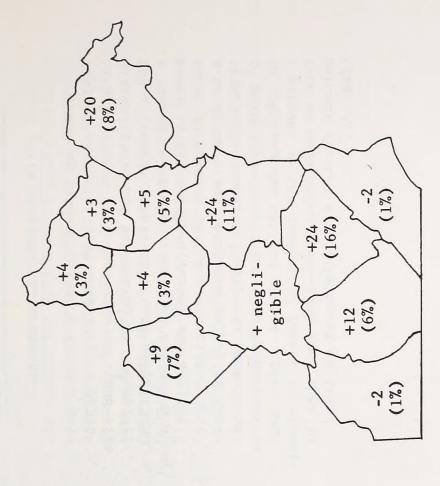


FIGURE 2.--Change in area of commercial forest land, by county, 1949 to 1963 (in thousands of acres and percent).

is in Sawtimber-Size Stands

percent stocked with growing-stock trees fied as nonstocked land--land less than 10 area is in stands composed mainly of saw-About 49 percent of the commercial forest exist in the Southern Cumberland Region. a fairly desirable stand-size situation does under present forest inventory definitions, classes would not be meaningful. However, changed since the last inventory, a depicin seedling and sapling stands. Less than in poletimber-size stands and 24 percent is timber-size trees. tion of trends in forest area by stand-size l percent of the commercial forest is classi-Because classification standards have Twenty-six percent is

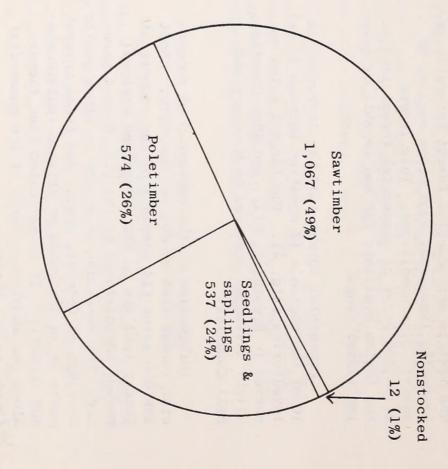


FIGURE 3.--Distribution of commercial forest area by stand-size class, 1963 (in thousands of acres and percent).

Oak-Hickory 899 (41%) Southern Pine Southern Pine 114 (5%) Hardwoods 726 (33%)

FIGURE 4.--Distribution of commercial forest area by forest type, 1963 (in thousands of acres and percent).

Redcedar-Hardwoods and Elm-Ash-Cottonwood

33 (2%)

Oak Stands are Predominant

The commercial forests of the Region are classified according to eight distinct forest cover types. Oak-hickory and white oak stands combined occupy more than 990,000 acres or 45 percent of the commercial forest area. The central mixed hardwoods type, consisting of a combination of species in-cluding yellow-poplar, basswood, maple, black walnut, and elm, accounts for another 33 percent. Pine and oak-pine stands make up 17 percent. The remaining commercial forest area is classified as redcedar-hardwood, maple-beech, or elm-ash-cottonwood

has Increased 24 Percent

The commercial forest acreage of the Southern Cumberland Region supports 19.9 million cords of growing-stock volume.

Since the last forest inventory the growingstock volume has increased from 7.7 to 9.1 cords on a per-acre basis (fig. 5). Overall, the volume has increased by 3.8 million cords, a gain of 24 percent or 1.7 percent per year (fig. 6).

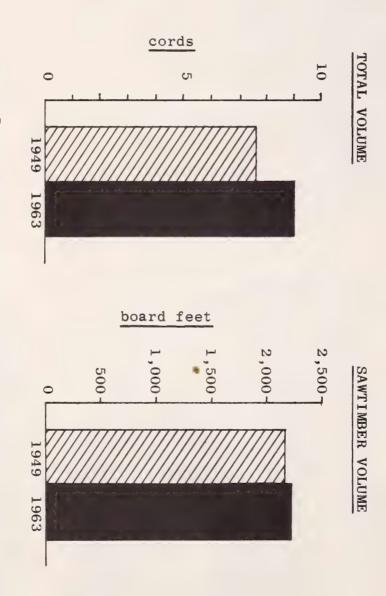


FIGURE 5.--Volume per acre on commercial forest land, 1949 and 1963.

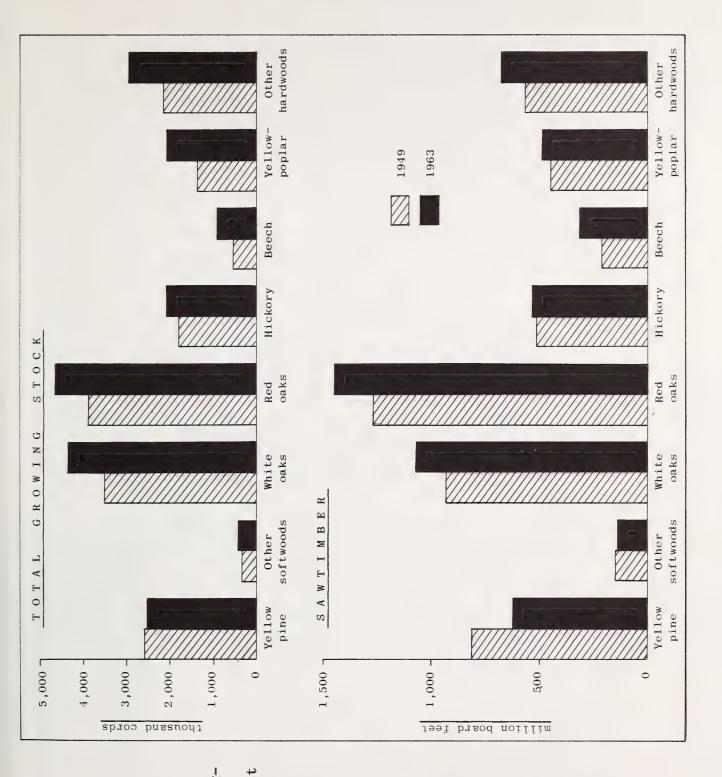


FIGURE 6.--Growing-stock volume on commercial forest land by major species groups, 1949 and 1963.

About 16.9 million cords or 85 percent of the Region's total growing-stock volume is in hardwood species and more than half of this hardwood volume is oak. Hardwood growing-stock volume is up 29 percent from what it was in 1949.

One-half of the Region's 2.9 million cords of softwood volume is shortleaf pine. Between surveys the volume of shortleaf pine decreased while that of other softwoods, Virginia pine and hemlock in particular, increased. All told, softwood growing stock increased 36 thousand cords or a little more than 1 percent.

Sawtimber Volume is up 8 Percent

The volume of sawlog-size material in the Region has increased 8 percent from 4,900 to 5,291 million board feet. Red oaks account for 1,443 million board feet (27 percent) and white oaks for 1,068 million board feet (20 percent) of the present volume. The volume of all hardwood sawtimber has increased by 590 million board feet, a gain of 15 percent. The sawtimber volume of nearly all the major hardwood timber species increased substantially. Softwood sawtimber volume fell off 20 percent to 770 million board feet between surveys.

The National Forests, though accounting for only 14 percent of the Region's commercial forest land area, contain 1,139 million board feet or 22 percent of the sawtimber volume.

Well over half of the Region's volume of softwood sawtimber is growing on National Forests.

Average sawtimber volume per acre has increased from 2,344 to 2,416 since the last inventory. About four-fifths of the sawtimber volume is in sawtimber-size stands which contain an average of 3,951 board feet per acre. Poletimber-size stands contain an average of 1,318 board feet per acre and other stands average 581 board feet per acre.

County Volume

Because the previous forest inventory of Kentucky lacked the intensification of the current inventory, no county volume statistics were provided in 1949. However, a comparison of 1963 statistics with unpublished estimates for 1949 allows us to view a few general trends. This comparison indicates that the total volume of growing stock has increased in nine of the Region's counties between surveys. The greatest percentage gains took place in Breathitt, Owsley, and Rockcastle Counties. Decreases occurred in Bell, Laurel, and Lee Counties.

McCreary has more timber volume than any of the other counties in the Region. This County accounts for 14 percent of the Region's total growing stock and 16 percent of the sawtimber volume. Almost 40 percent of the Region's softwood sawtimber volume is located in McCreary County.

TABLES

Table 1.--Forest land area by counties, Southern Cumberland Region, Kentucky, 1963

		Forest land area		Total forest as
County	Total	Commercial	Noncommercial	a percent of total land area
	Thousand acres	Thousand acres	Thousand acres	Percent
Be11	211.6	199.0	12.6	4.68
Breathitt	281.3	280.4	0.	0.68
Clay	247.0	546.6	† .	81.4
Estill	125.4	124.8	9.	75.4
Jackson	161.1	160.0	H.	7.47
Knox	177.9	177.8	۲.	74.5
Laurel	188.7	185.1	3.6	9.99
Lee	7.601	108.9	Φ.	81.6
McCreary	250.1	245.9	₽ . ₽	95.8
Owsley	2.96	9.96	۲.	7.97
Rockcastle	9.041	139.2	7.7	7.07
Whitley	228.0	256.2	1.8	77.8
מסיולמייסס ררא	ר ארט ט	り り い い	9.20	70.0
	1.01767	\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.) - -	

Southern Cumberland Region, Kentucky, 1963

Forest type	All stands	Sawtimber	Poletimber	Saprings and s eedlings	Nonstocked
Commercial forest					
	113.5	39.0	33.2	41.3	,
Redcedar-hardwoods	13.4	ı		13.4	1
Oak-pine	265.0	125.3	70.3	69.4	1
White oak	91.1	54.9	30.0	6.2	
Oak-hickory	899.3	552.3	216.6	130.4	1
Central mixed hardwoods	726.5	261.3	201.8	251.1	12.3
Maple-beech	61.9	30.4	15.4	16.1	
Elm-ash-cottonwood	19.8	3.8	6.7	9.3	1
All commercial forest	2,190.5	1,067.0	574.0	537.2	12.3
Noncommercial forest Productive-reserved Unproductive forest	22.7 4.9	16.6	4.8	1.3	4.9
All noncommercial forest	27.6	16.6	4.8	1.3	4.9
All forest area	2,218.1	1,083.6	578.8	538.5	17.2

Table 3.--Commercial forest land area, by type and stand-size class,

Bell County, Kentucky, 1963

(In thousands of acres)

Forest type	A11 stands	Sawtimber	: Poletimber	: Saplings : and : seedlings	: Nonstocked
Southern pine Redcedar-hardwoods Oak-pine White oak Oak-hickory Central mixed hardwoods	15.1 15.1 4.7 89.6 72.2 7.3	u 9 9 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	23.5 20.3 20.3 20.3	3.6 9.5 1.5 1.6 1.0	111181
Elm-ash-cottonwood	2.5	5	1.1	6.	1
Total	199.0	94.1	51.9	51.2	1.8

Table 4.-- Commercial forest land area, by type and stand-size class,

Breathitt County, Kentucky, 1963

Forest type	All stands	Sawtimber	: Sawtimber : Poletimber :	Saplings and seedlings	Nonstocked
Southern pine	8.1	2.5	2.0	3.6	1
Redcedar-hardwoods	1.1	ţ	ı	1 1	1
Oak-pine	22.9	9.2	4.6	7.3	1
White oak	ۍ ن	2.7	2.6		1
Oak-hickory	130.6	80.6	31.1	18.9	
Central mixed hardwoods	99.2	36•3	28.7	32 . 3	1.9
Maple-beech	9.6	4.6	2°.5	2.5	1
Elm-ash-cottonwood	3.6	.8	1.2	1.6	1
Total	280.4	136.7	74.5	67.3	1.9

Table 5 .-- Commercial forest land area, by type and stand-size class,

Clay County, Kentucky, 1963

(In thousands of acres)

Forest type	All	Sawtimber	: Poletimber	Saplings and seedlings	Nonstocked
Southern pine	9.3	3.3	2.1	3.9	ı
Redcedar-hardwoods	1.3	1	1	1.3	i
Oak-pine	25.0	11.1	6.5	4.7	
White oak	4.5	2.3	ય	•	ı
Oak-hickory	108.5	65.8	25.9	16.8	,
Central mixed hardwoods	89.5	29.5	27.8	31.1	1.1
Maple-beech	9.9	3.0	1.8	л. П.	,
Elm-ash-cottonwood	1.9	ಣಿ	9•	1.0	1
Total	246.6	115.3	6.99	63.3	1.1

31.5

-7

7.5 14.2

0.7

9.0

Saplings

Nonstocked

seedlings and

ν ω

14

Table 7.--Commercial forest land area, by type and stand-size class

Jackson County, Kentucky, 1963

Forest type	All stands	Sawtimber	: Poletimber	: Saplings : and : seedlings	: Nonstocked
Southern pine Redcedar-hardwoods Oak-pine White oak Oak-hickory Central mixed hardwoods	8 9 17 4 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	0 11 74 71 9 8 1 0 0 9 9 4 0 9	0.7 3.5 4.41 4.41	8.4.6.6.7.6.6	
Elm-asn-cottonwood Total	160.0	77.2	0.64	32.8	0.1

Knox County, Kentucky, 1963

Total	Southern pine Redcedar-hardwoods Oak-pine White oak Oak-hickory Central mixed hardwoods Maple-beech	Forest type
177.8	14.6 79.2 67.1 67.1	All
76.8	1.0 5.5 1.8 16.9 19.0	Sawtimber
50.5	20.88 20.88 1.8	: Poletimber
49.1	1.2 25.9 25.9 1.0 2.1 2.0 2.0 2.0	Saplings and seedlings
1.4	1	Nonstocked

Table 9.--Commercial forest land area, by type and stand-size class

Laurel County, Kentucky, 1963

(In thousands of acres)

Forest type	All stands	Sawtimber	: : Poletimber	Saplings and seedlings	Nonstocked
Southern pine Redcedar-hardwoods Oak-pine White oak	14.8 10.4 14.0	4.1 2.12 12.4	3. 6. 6. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	7.3 2.7 10.4	1111
Oak-hickory Central mixed hardwoods Maple-beech Elm-ash-cottonwood	55.8 55.6 1.5	37.4 26.2 .5	10.2 7.9 2.	8.2 21.0 .8	0.51
Total	185.1	101.8	31.9	50.9	•5

Lee County, Kentucky, 1963

Total	Southern pine Redcedar-hardwoods Oak-pine White oak Oak-hickory Central mixed hardwoods Maple-beech	Forest type
108.9	12.9 14.9 39.4 39.4 8.0	All stands
49.8	1.8 26.0 13.3 1.3	Sawtimber
28.3	0.9 3.5 11.3 10.8	: Sawtimber : Poletimber
30.1	2.2 14.6 14.6	Saplings and seedlings
7.	0.71111	Nonstocked:

Table 11. -- Commercial forest land area, by type and stand-size class McCreary County, Kentucky, 1963

Forest type	All stands	Sawtimber	: Poletimber	: Saplings and : seedlings	: Nonstocked
Southern pine Redcedar-hardwoods Oak-pine White oak Oak-hickory Central mixed hardwoods Maple-beech Elm-ash-cottonwood	29.1 32.2 70.9 55.5	26.5 17.3 17.3 4.5.4 25.7 3.0	14.6 10.0 17.0 15.1 1.3	4 6 4 4 1 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	11111911
Total	245.9	133.5	68.5	43.3	9.

Owsley County, Kentucky, 1963

(In thousands of acres)

	Total	Southern pine Redcedar-hardwoods Oak-pine White oak Oak-hickory Central mixed hardwoods Maple-beech	Forest type
	96.6	.c. 4 .c. 4 .c. 6 .c. 6	All
	36.9	0.7 2.9 2.5 21.4 10.3 1.0	Sawtimber
	25.1	0.5 1.7 1.7 11.1 10.7	Sawtimber : Poletimber :
,	33.7	2.0 2.3 2.3 17.2 1.7	Saplings and seedlings
	•9	0,01111	: Nonstocked

Table 13.--Commercial forest land area, by type and stand-size class Rockcastle County, Kentucky, 1963

Forest type	All	Sawtimber	: Poletimber	Saplings and seedlings	Nonstocked
Southern pine Redcedar-hardwoods Oak-pine White oak Oak-hickory Central mixed hardwoods Maple-beech Elm-ash-cottonwood	3.2 6.1 6.1 1.4 1.4 1.1 8.	0.8 8.8 3.6 1.57	0. 1 0.0 KL 0. 10.44 0.4.004	4.0.0.4.7.0.4.2.	11111611
Total	139.2	73.7	36.4	28.8	က္

Table 14. -- Commercial forest land area, by type and stand-size class

Whitley County, Kentucky, 1963

Forest type	All	Sawtimber	Sawtimber : Poletimber :	Saplings and seedlings	Nonstocked
Southern pine	19.6	6.6	7.3	J.7	1 1
Kedcedar-nardwoods Oak-pine	25.0	10.4	7.1	7.5	1 1
White oak	6.7	ω &	2.5	• 4	•
Oak-hickory	90.5	57.0	20.7	12.8	1
Central mixed hardwoods	74.6	29.4	18.3	25.5	1.4
Maple-beech Flm-ash-cottonwood		ω 8 4	1.3 0	1.1 .7	ı I
Total	226.2	4. TTT	58.2	55.2	1.4

Table 15.--Net timber volume on commercial forest land, by species and stand-size classes, Southern Cumberland Region, Kentucky, 1963

		Chourt no	700+2			redm: Hunder	hen	
χ. 	Total	Sawt	oletimber:	Other	Total	Sawti		Other
	Thousand cords1/	Thousand cords 1/	Thousand cords1/	Thousand cords1/	Million board feet2	Stands Million board feet2/	Stands Million board feet2	stands Million board feet2/
Softwoods: Shortleaf pine Other yellow pine White pine	1,464.2	946.5 529.4 53.3	359.0 377.5 10.7	158.7	383.34 243.10 3.60	280.98	69.46 71.38 .40	32.90
Other softwoods 3/ All softwoods	2,930.8	17.5	5.3	317.9	3.72	3.11	159.04	54.64
Hardwoods: Select white oak Select red oak	2,598.9	1,881.5	592.3 154.2	125.1	567.65	473.89 212.30	68.07 34 . 12	25.69 12.18
Other white oak Other red oak	1,747.4 3,892.8	1,320.0	329.4 796.4	98.0 229.6	1,184.05	418.71 980.45	61.16 138.98	20.10 64.62
Select hickory Other hickory	925.8	574.5 836.1	257.9 243.6	93°4 56°4	235.41 297.94	168.74 262.48	47.05 26.78	19.62 8.68
Yellow birch Hard maple	14.6 307.6	210.2	4°28 82°2	15.2	2.56 63.01	2.56 50.48	00.6	3.53
Beech Black walnut	899.7	4° 401 4° 64	130.4	64.9 20.5	317.14	270.49 6.47	27.20	19.45
Ash	269.2	167.9	98.1	000	54.70	44.38	8.91	- H
Soft maple	4.618 4.618	541.2	227.8	50.4	182.85	152.29	23.38	7.18
Sweetgum Blackonm	229.0	300.1	55.0 64.0	36.9	62.20	50.83 96.77	4.8	3.93
Sycamore	66.3	28.2	11.8	26.3	7.88	6.75	1	1.13
Yellow-poplar Basswood	2,047.1	1,099.3	791.2	156.6	485.97	349.67	109.82	26.48
Other soft hardwoods	355.5	188.3	133.9	33 33 30 40 40 40 40 40 40 40 40 40 40 40 40 40	77.92	51.85	13.72	12.35
All hardwoods	16,944.6	11,727.6	4,105.8	1,111.2		3,659.50	597.39	
All species	19,875.4		4,908.7	1,429.1	5,291.38	4,215.84	756.43	319.11
To convert to cubic reet multiply	ubic feet mu	TIDIN DN (2,					

To convert to cubic feet multiply by 79. International 1/4-inch rule. Mainly redcedar.

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Table 16 .-- Net timber volume on commercial forest land by counties and species groups,

Southern Cumberland Region, Kentucky, 1963

Counties	Gro	Growing stock	K		Sawtimber	
	: Total :	:Softwoods:Hardw	Hardwoods:	Total	Softwoods	: Hardwoods
	Thousand cords1/	Thousand cords1/	Thousand cords1/	Million board feet2/	Million board feet2/	Million board feet2/
Bell Bell	1,675.9	164.6	1,511.3	442.19	38.12	404.07
Breathitt	2,409.6	235.3	2,174.3	637.55	54.76	582.79
Clay	2,079.8	204.9	7	545.35	47.20	498.15
Estill	1,081.0	113.2	967.8	284.57	27.14	257.43
Jackson	1,546.7	194.0	1,352.7	361.25	47.78	313.47
Knox	1,452.1	145.4	1,306.7	373.79	32.86	340.93
Laurel	1,728.0	293.6	1,434.4	485.33	83.30	402.03
Lee	930.2	102.3	827.9	240.31	23.46	216.85
McCreary	2,832.8	938•3	1,894.5	863.58	289.18	574.40
Owsley	738.5	78.7	659.8	184.88	17.86	167.02
Rockcastle	1,284.3	137.0	1,147.3	336.32	33.37	302.95
Whitley	2,116.5	323.5	1,793.0	536.26	74.99	461.27
All counties	19,875.4 2,930.8	2,930.8	16,944.6	5,291.38	770.02	4,521.36

To convert to cubic feet multiply by 79. International 1/4-inch rule.

DEFINITION OF TERMS

Stand and Tree-Size Classes

Sawtimber stands.—Stands at least 10 percent stocked with growing-stock trees with half or more of this stocking in sawtimber or poletimber trees and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber trees are live trees of commercial species at least 9.0 inches in diameter breast height for eastern softwoods and 11.0 inches in diameter breast height for hardwoods containing at least one merchantable saw log.

A merchantable saw log is defined as a log (a) with a minimum top diameter of 8 inches, (b) with a minimum length of 8 feet, (c) containing at least 50 percent sound volume; and (d) meeting the minimum log-grade or tie-andtimber specification. "Local-use" logs of poorer quality are not included even though used locally.

Poletimber stands.—Stands at least 10 percent stocked with growing-stock trees with half or more of this stocking in sawtimber or poletimber trees and with poletimber stocking ing exceeding that of sawtimber stocking.

Poletimber trees are defined as live trees of commercial species 5.0 to 8.9 inches in diameter breast height for softwoods, and 5.0 to 10.9 inches in diameter breast height for hardwoods, and of good form and vigor.

Sapling and seedling stands.--Stands at least 10 percent stocked with growing-stock trees with more than half of this stocking in saplings and/or seedlings.

Seedlings and saplings are well-established live trees of commercial species less than 5.0 inches in diameter and of good form and vigor.

Nonstocked areas.--Commercial forest lands less than 10 percent stocked with growingstock trees. Stocking.--Stocking is a measure of area occupancy using dominant and codominant growing-stock trees.

Forest Types

Southern pine.--Forests in which 50 percent or more of the stand is southern pine (usually shortleaf pine).

Redcedar-hardwoods.--Forests in which 50 percent or more of the stand is hardwoods but in

Oak-pine.--Forests in which 50 percent or more of the stand is hardwoods (usually upland oaks) but in which hard pines make up 25 to 49 percent of the stand.

White oak.--Forests in which 50 percent or more of the stand is white oak.

Oak-hickory.--Forests in which the upland oaks and hickories singly or in combination comprise over 50 percent of the stand, except for stands classed white oak, redcedar-hardwoods, or mixed hardwoods.

Central mixed hardwoods.--Forests in which yellow-poplar, maple, beech, basswood, black walnut, elm, and northern red oak make up over 50 percent of the stand, except for stands classed maple-beech and elm-ash-cottonwood.

Maple-beech.--Forests in which maple and/or beech comprise 50 percent or more of the stand.

Elm-ash-cottonwood.--Forests in which 50 percent or more of the stand is elm, silver maple, sweetgum, sycamore, boxelder, ash, or cottonwood singly or in combination.

Softwoods.--Coniferous species which include pine, hemlock and redcedar.

Soft hardwoods.--Soft-textured, broad-leaved species which include elm, soft maple, sweet-gum, blackgum, yellow-poplar, cottonwood, and sycamore.

Hard hardwoods.--Firm-textured, broad-leaved species which include all of the oaks and hickories, hard maple, birch, black walnut, and ash.

Select white oak.--Includes only white, swamp chestnut, swamp white, bur, and chinkapin white oaks.

Other white oak.--Includes all white oaks other than those listed above.

Select red oak.--Includes only cherrybark, northern red and Shumard red oaks.

Other red oak.--Includes all red oaks other than those listed above.

Select hickory.--Includes only shagbark, shellbark and mockernut hickories.

Other hickory.--Includes all hickories other than those listed above.

